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MOORE, KARLA A				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/786,876

**Applicant(s)**

PARKHE ET AL.

**Examiner**

KARLA MOORE

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5,6,12,14-16 and 18-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5,6,12,14-16 and 18-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 0809
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The declarations filed under 37 CFR 1.132 on 20 December 2006 appear remain insufficient to overcome the rejection of claims 12, 14, 17 and 19 based upon U.S. Patent Publication 2004/0055709 to Boyd, as set forth below, because: sufficient evidence has not been provided in order to establish that the disclosure of Boyd et al. is (or arose from) Applicant's own work (via 1.132 affidavit or declaration), nor, has a showing of conception by the Applicant before the filing date of the references been provided (via 1.131 affidavit or declaration), as needed. MPEP 2136 sets forth that a showing that the disclosure of a reference is Applicant's own work can be made by proving that the patentee, or the inventor(s) of the U.S. Patent Pubs was associated with Applicant (e.g. worked for the same company) and learned of applicant's invention from applicant via a 1.132 affidavit or declaration. In the instant case, Examiner notes that Boyd et al. has a different inventive entity. In fact, it does not even have a single inventor in common and no statement has been made that satisfies the above requirement. It appears that further evidence is needed to establish that Boyd et al. is not proper prior art under 102e.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 58 and 61-63 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for "an adhesion layer comprising metal", does not reasonably provide enablement for "an adhesion layer consisting of metal". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. Examiner has located portions of Applicant's specification where "an adhesion layer comprising" metal is set forth. However, Applicant's assistance is requested in locating a portion of the specification where "an adhesion layer consisting of metal" is disclosed. In the meantime, the claims are rejected in part over the disclosure of Massler, which in fact sets forth an adhesion layer consisting of metal.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 12, 14 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2004/0055709 A1 to Boyd et al.

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6. The applied reference has a common assignee with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

7. Regarding claims 12 and 14: Boyd et al. disclose a substrate support comprising: a ceramic dielectric (102) comprising an embedded electrode (104); and a plurality of mesas (see elevated surface of support in Figures 3 and 4) on the dielectric, the mesas comprising a coating of diamond-like carbon material directly over a titanium metal adhesion layer (paragraphs 2 and 30, wherein the portion of the mesa that is not the coating is considered to be the titanium metal adhesion layer). The diamond-like carbon coating comprises a coefficient of friction of less than about 0.3 and a hardness of at least about 8 Gpa and a thickness of from about 1 to about 20 microns (paragraph 27).

8. With respect to claim 19, the ceramic structure comprises AlN or Al<sub>2</sub>O<sub>3</sub> (paragraph 29).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 12, 14-15, 19 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,736 to Anderson et al. in view of U.S. Patent No. 5,969,934 to Larsen and U.S. Patent No. 7,160,616 to Massler et al.

12. Regarding claims 12 and 58: Anderson et al. disclose a substrate support substantially as claimed and comprising: (a) a ceramic substrate support structure (Figures 1 and 3, 11); and (b) a coating (21) on the support structure comprising a plurality of mesas (19), each mesa substantially entirely composed of a surface coating (i.e. only a single other structure 19' is part of the mesas) whereby the contact surface of the coating is capable of reducing abrasion and contamination of a substrate that contacts the surface (column 3, row 65 through column 4, row 12 and column 4, row 66 through column 5, row 5). The substrate support of Anderson is a known-in-the-art electrostatic substrate support that is provided with a tough and wear resistant contact surface (for example, column 6, rows 26-43). Anderson discloses an example of how

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the electrostatic substrate support , i.e. the (metallic base/body), ceramic and dielectric, may be arranged with respect to one another, but also states that other means of attachment/arrangement may be used (column 6, rows 8-26).

13. However, Anderson et al. fails to explicitly an electrostatic substrate support structure specifically constructed as a ceramic comprising an electrode embedded therein, as is conventionally known in the art and/or with a diamond-like carbon coating contact surface.

14. Larsen et al. do however provide such a teaching. In Larsen, an electrostatic substrate support comprising a ceramic with an electrode embedded therein is provided for the purpose of electrostatically clamping a substrate in a vacuum processing chamber as is conventionally known in the art (Figures 1-4; abstract and column 4, row 6 through column 5, row 25). Larsen et al. also teach the provision of a dielectric coating (e.g. diamond-like carbon) contact surface with a low friction, high hardness forming the substrate clamping surface for the purpose of lowering friction between the clamping surface of the substrate support and the substrate to be processed and for the purpose of providing a relatively hermetic seal over the insulating ceramic structure (column 3, rows 23-43 and column 7, row 12 through column 8, row 3).

15. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an electrostatic substrate support comprising a ceramic with an electrode embedded therein and a diamond-like carbon coating contact surface thereon in Anderson et al. in order to electrostatically clamp a substrate in a vacuum processing chamber while at the same time lowering friction

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between the clamping surface of the substrate support and the substrate to be processed and also providing a relatively hermetic seal over the insulating ceramic structure as taught by Larsen.

16. Anderson and Larsen et al. disclose the invention substantially as claimed and as described above.

17. However, Anderson and Larsen et al. fail to teach specific properties and characteristics for the diamond-like carbon coating, for example, the coating comprising a carbon-hydrogen network, and the coating having a contact surface comprising a coefficient of friction of less than about 0.3 and a hardness of at least about 8 GPa.

18. Massler et al. teach providing a coating of diamond-like carbon (DLC) with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on a structure/substrate where wear protection, corrosion protection and improvement of slipping properties and the like are of importance (abstract and column 20, about rows 16-48).

19. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the coating comprising a DLC coating with a coefficient friction of less than about 0.3 and a hardness of at least about 8 Gpa on the substrate support in Anderson and Larsen et al. in order to impart wear protection, corrosion protection and improvement of slipping properties and the like as taught by Massler et al.



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20. Massler et al. further disclose the provision of an adhesion layer consisting of titanium metal directly below the diamond-like carbon coating for the purpose of providing a DLC coating with excellent adhesion (column 3, rows 47-56 and column 4, rows 21-30).

21. With respect to claims 14 and 15, the coating of Massler et al. comprises a thickness of from about 1 to about 20 microns and the titanium layer comprises a thickness from about 0.25 microns to about 4 microns (column 5, rows 16-21).

22. With respect to claim 19, Larsen et al. disclose the ceramic structure comprises AlN or Al<sub>2</sub>O<sub>3</sub> or other ceramic materials with high dielectric strength and high permittivity and that do not exhibit bulk polarization at the frequency and voltage used for clamping (column 4, rows 60-65 and column 5, rows 15-17).

23. Claims 5-6, 16 and 18, 20, 61-63 are rejected under 35 U.S.C. 103(a) as being unpatentable Anderson et al. and Massler et al. as applied to claims 1, 7-10, 12, 14-15, 19 and 58 above, and further in view of U.S. Patent No. 5,352,493 to Dorfman et al.

24. Regarding claims 5-6 and 16, 18, 20 and 61-63: Anderson et al. and Massler et al. disclose the substrate support substantially as claimed and as described above.

25. However, Anderson et al. and Massler et al. fail to teach the diamond-like material comprises a diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen and/or providing the diamond-like material comprising from about 0.1 atom % to about 10 atom % of a metal additive.

26. Dorfman et al. teach providing diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen as a protective film for the purpose of providing a coating having high strength and microhardness, flexibility, low coefficient of friction, and high thermal and chemical stability (abstract).

27. Dorfman et al. further teach providing the diamond-like material comprising from about 0.1 atom % to about 10 atom % of a metal additive, whereby the metal additive changes the resistivity of the coating, which is from about  $10^4$  ohm·cm to about  $10^8$  ohm·cm, thus, further optimizing the diamond-like carbon coating (Figures 1A-C and 2; column 4, row 43 through column 5, row 27).

28. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided the diamond-like nanocomposite having networks of (i) carbon and hydrogen and (ii) silicon and oxygen as a protective film in order to provide a coating having high strength and microhardness, flexibility, low coefficient of friction, and high thermal and chemical stability and to have also provided metal additive in order to change the resistivity of the coating and thus allow for further optimization of the coating as taught by Dorfman et al.

29. With respect to the process by which the DLC layer with metal additive is deposited (e.g. claim 20), Dorfman et al. disclose a method wherein the diamond-like material is co-deposited with a metal additive by a process of combining physical vapor deposition (PVD) of the metal additive in a plasma enhanced chemical vapor deposition (PECVD) environment (column 5, row 57 through column 6, row 37). However, it is also

noted that courts have ruled "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

### ***Response to Arguments***

30. Applicant's arguments filed 14 August 2009 have been fully considered but they are not persuasive.

31. With respect to rejections based on a combination of the Boyd reference: Applicant has argued that it is clear that the Boyd does not disclose an additional adhesion layer between the diamond like carbon coating (which is part of the mesa) and the ceramic structure. Examiner disagrees. As pointed out above, the titanium metal adhesion layer is considered to be the portion of the mesas, that is not the diamond like carbon coating and is also not the body of the ceramic structure. It is between the two. With respect Applicant's arguments regarding the provision of a titanium metal adhesion layer in Boyd et al., Examiner maintains that the layer disclosed in Boyd et al. which may comprise titanium metal as part of the alloy reads on the claimed titanium metal adhesion layer.

32. With respect to rejections based on a combination of the Anderson, Larsen and Massler references: Applicant has argued that it would not have been obvious to incorporate the teachings (i.e. coating properties) of Anderson with those of Larsen and/or Massler. Examiner disagrees in general and points out specifically 1) in response to Applicant's argument(s) against the use of Anderson as a "primary reference", there is no minimum amount of subject matter that must be relied upon in a "primary reference" of a multi-reference-type obviousness rejection in order to make it proper, and 2) in response to Applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

33. Further, Examiner notes that motivation for combination can be found in Larsen at column 3, rows 23-43 and column 7, row 12 through column 8, row 3, for example and in Massler at abstract and column 20, about rows 16-48, for example, as pointed out in the above and previous office actions. Examiner also notes that the rejection is not based on replacing, per se, the coating of Anderson with that of Larsen or Massler, as Applicant argues. Rather the rejection is based on incorporating the advantageous feature(s) of the two references into the disclosure of Anderson, for example, a DLC coating, in the case of Larsen and a coating with the friction and hardness properties set forth in Massler. This methodology of forming the above rejection also renders Applicant's arguments, regarding all of the claimed features that are missing from each

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reference for which the references are not relied upon, mute. As noted above, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. Also, Examiner notes that the mere fact that a disclosed structure has benefits in and of itself does not make it irreplaceable, inadaptatable and/or incapable of being improved upon. It is quite common to improve upon and adapt structures in a way set forth as in the above rejection. Further, the courts have ruled that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, the aforementioned teachings would have suggested to one of ordinary skill in the art that the disclosures of the relied upon prior art are capable of being combined in order to adapt and/or improve upon each of the individual disclosures. Examiner maintains that the coatings of the prior art are similar enough and/or used for similar reasons/endeavors such that one of ordinary skill in the art exercising ordinary creativity, common sense and logic would have been motivated to seek out, consider and incorporate their disclosures for possible improvements as laid out in the above rejections.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARLA MOORE whose telephone number is (571)272-1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karla Moore/  
Primary Examiner, Art Unit 1792